UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,997	03/21/2001	Minoru Yamada	109016	3891

25944 7590 12/18/2003

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
BATTAGLIA, MICHAEL V	
ART UNIT	**PAPER NUMBER**
2652	

DATE MAILED: 12/18/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/812,997	YAMADA ET AL.	
	Examiner	Art Unit	
	Michael V Battaglia	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10-12 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities:

a.) On page 2, line 17, the examiner suggests replacing "near-filed" with -near-field-.

b.) On page 7, line 27, the examiner suggests replacing "first" with -second-.

c.) On page 7, line 28, the examiner suggests replacing "second" with -third-.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itaya et al (hereafter Itaya) (US 5,343,486) in view of Thronton et al (hereafter Thronton) (US 6,574,257).

In regard to claim 1, Itaya discloses a semiconductor device to be used in a high-density optical disc system (Col. 1, lines 13-15) comprising: a distributed feedback laser (Col. 7, lines 53-56) including first and second cladding layers (Fig. 5, elements 53 and 57), an active layer sandwiched between said first and second cladding layers (Fig. 5, element 54), a first reflecting

member having a periodic wave-shaped structure formed within said first cladding layer at an interface between said active layer and said first cladding layer or in close proximity to said active layer (Fig. 5, element 56), a third reflecting member provided on a second end surface of said assembly (Fig. 5, element 63), and first and second current injection electrodes electrically connected to said first and second cladding layers, respectively (Fig. 5, elements 61-62); and an injection current source connected to said first and second current injection electrodes (Col. 12, line 9). The examiner notes that there are two electrodes and that the definition of an electrode is a solid electric conductor through which an electric current enters or leaves an electrolytic cell or other medium (*The American Heritage® Dictionary of the English Language, Fourth Edition*). Therefor, the injection current source would inherently be connected to the electrodes so that current would enter through one electrode and current would leave through the other electrode. Itaya does not disclose that the semiconductor device to be used in a high-density optical disc system is a near-field optical head or that a second reflecting member is provided on a first end surface of an assembly of said first and second cladding layer and active layer that has an exit window formed by a fine aperture; whereby laser light emitted from said exit window of the distributed feedback laser is made incident upon an optical record medium arranged in a near-field.

Thronton discloses a second reflecting member (Fig. 1, elements 28-30) provided on a first end surface of an assembly (Fig. 1, element 16) having an exit window formed by a fine aperture (Fig. 1, element 32); whereby laser light emitted from said exit window of the distributed feedback laser is made incident upon an optical record medium arranged in a near-field (Col. 1, lines 8-10). Thronton teaches that use of an exit window formed by a fine aperture will enables a semiconductor device to be used in a near-field optical head by restricting the emitted beam to the

size of the exit window, thereby reducing the size of the laser beam spot formed on an optical disc in the near-field and increasing the amount of data that can be recorded to and reproduced from the optical disc (Col. 1, line 64 - Col. 2, line 9 and Col. 6, lines 40-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide on the first end surface of the assembly of the first and second cladding layers and the active layer of Itaya the second reflecting member having an exit window formed by a fine aperture of Thronton and to emit laser light from the exit window upon an optical record medium arranged in a near-field as suggested by Thronton, the motivation being to enable a semiconductor device to operate as a near-field optical head that will increase the amount of data that can be recorded to and reproduced from an optical disc.

In regard to claim 2, Itaya discloses that the said periodic wave-shaped structure of the first reflecting member has a smooth wave configuration (Fig. 5, element 56).

In regard to claim 3, Thronton discloses that the said second reflecting member includes a dielectric film (Fig. 1, elements 28-29) provided on the first end surface of the assembly of the first and second cladding layers and active layer (Fig. 1, element 16), and a metal film formed on the dielectric film and having formed therein said fine aperture constituting said exit window (Fig. 1, element 30).

In regard to claim 4, Itaya discloses that the said third reflecting member is formed by multiple dielectric films (Fig. 5, element 63; Col. 4, lines 33-36 and 52-53; and Col. 8, lines 1-2).

In regard to claims 5, 7, and 10, Itaya in view of Thronton discloses the near-field optical head of claim 1. Itaya in view of Thronton as applied to claim 1, does not disclose that the near-field optical head is constructed as a recording and reproducing optical head for recording

information on the optical record medium and reproducing the information from the optical record medium.

Thronton discloses that the near-field optical head is constructed as a recording and reproducing optical head for recording information on the optical record medium and reproducing the information from the optical record medium (Col. 1, lines 8-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the near-field optical head of Itaya in view of Thronton as applied to claim 1 as a recording and reproducing optical head for recording information on the optical record medium and reproducing the information from the optical record medium as suggested by Thronton, the motivation being to read and write information from and to an optical record medium arranged in the near-field.

In regard to claim 6, Thronton discloses that a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium (Col. 3, line 64 - Col. 4, line 2 and Col. 6, lines 29-51).

In regard to claim 8, Thronton discloses that a constant current is injected into the distributed feedback laser from said injection current source to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light is made incident upon the optical record medium through said exit window (Col. 5, lines 25-26), laser light reflected by the optical record medium is returned into the distributed feedback laser through said exit window, and a voltage change appearing across said first and second current injection

electrodes is detected to produce a reproduced signal representing the information recorded on the optical record medium (Fig. 1, element 38; Fig. 2; Col. 5, lines 46-65, and Col. 7, lines 34-59).

In regard to claim 9, Thronton discloses that a constant current is injected into the distributed feedback laser to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light having a constant intensity is made incident upon the optical record medium, and laser light reflected by the optical record medium is returned into the distributed feedback laser by means of the exit window and is amplified therein; whereby the near-field optical head further comprises a photodetector for receiving laser light emanating from said third reflecting member to produce a reproduction signal representing the information recorded on the optical record medium (Fig. 1, element 44; Col. 5, line 66 - Col. 6, line 5; and Col. 7, lines 34-59). The examiner notes that the reflectance of the Thronton's rear facet (Fig. 1, element 18) has a high reflectance (Table 1), which is similar to the reflectance of the third reflecting member of Itaya (Fig. 5, element 63).

In regard to claim 11, Thronton discloses that upon recording the information on the optical record medium, a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium (Col. 3, line 64 - Col. 4, line 2 and Col. 6, lines 29-51); and upon reproducing the information from the optical record medium, a constant current is injected into the distributed feedback laser from said injection current source to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light is made incident upon the optical record medium through said exit window (Col. 5, lines

25-26), laser light reflected by the optical record medium is returned into the distributed feedback laser through said exit window, and a voltage change appearing across said first and second current injection electrodes is detected to produce a reproduced signal representing the information recorded on the optical record medium (Fig. 1, element 38; Fig. 2; Col. 5, lines 46-65, and Col. 7, lines 34-59).

In regard to claim 12, Thronton discloses that the near-field optical head further comprises a photodetector (Fig. 1, element 44); and upon recording the information on the optical record medium, a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium (Col. 3, line 64 - Col. 4, line 2 and Col. 6, lines 29-51); and upon reproducing the information from the optical record medium, a constant current is injected into the distributed feedback laser to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light having a constant intensity is made incident upon the optical record medium, laser light reflected by the optical record medium is returned into the distributed feedback laser by means of the exit window and is amplified therein, and laser light emanating from said third reflecting member is detected by said photodetector to produce a reproduction signal representing the information recorded on the optical record medium (Fig. 1, element 44; Col. 5, line 66 - Col. 6, line 5; and Col. 7, lines 34-59). The examiner notes that the reflectance of the Thronton's rear facet (Fig. 1, element 18) has a high reflectance (Table 1), which is similar to the reflectance of the third reflecting member of Itaya (Fig. 5, element 63).

Citation of Relevant Prior Art

4. Ueyanagi (US 6,597,715) discloses a near-field optical head that writes by modulating laser power in accordance with information to be recorded on an optical record medium and has an active layer surrounded by cladding layers, a rear facet reflector, and a front facet reflector made of a dielectric layer and a metal layer (Figs. 1A and 1B). Yoshida et al (US 4,716,570) discloses a distributed feedback laser with a periodic diffraction grating and active layer surrounded by cladding layers (Figs. 1 and 2). Lee et al (US 6,480,222) discloses a near-field optical head with a front facet reflector and a rear facet photodetector (Figs. 4 and 5).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Battaglia whose telephone number is (703) 305-4534. The examiner can normally be reached on 5-4/9 Plan with 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Michael Battaglia

BRIAN E. MILLER
PRIMARY EXAMINER